

NOTES CONTINUED:

5. BAG AND TAG ASSEMBLIES INDIVIDUALLY WITH THEIR DRAWING NUMBER, REVISION, VARIANT OR "TYPE", AND SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. EXAMPLE (TAG): DXXXXXX-VY, TYPE-RIGHT, S/N 001

6. MASS: 8.336 KG [18.377 LB].

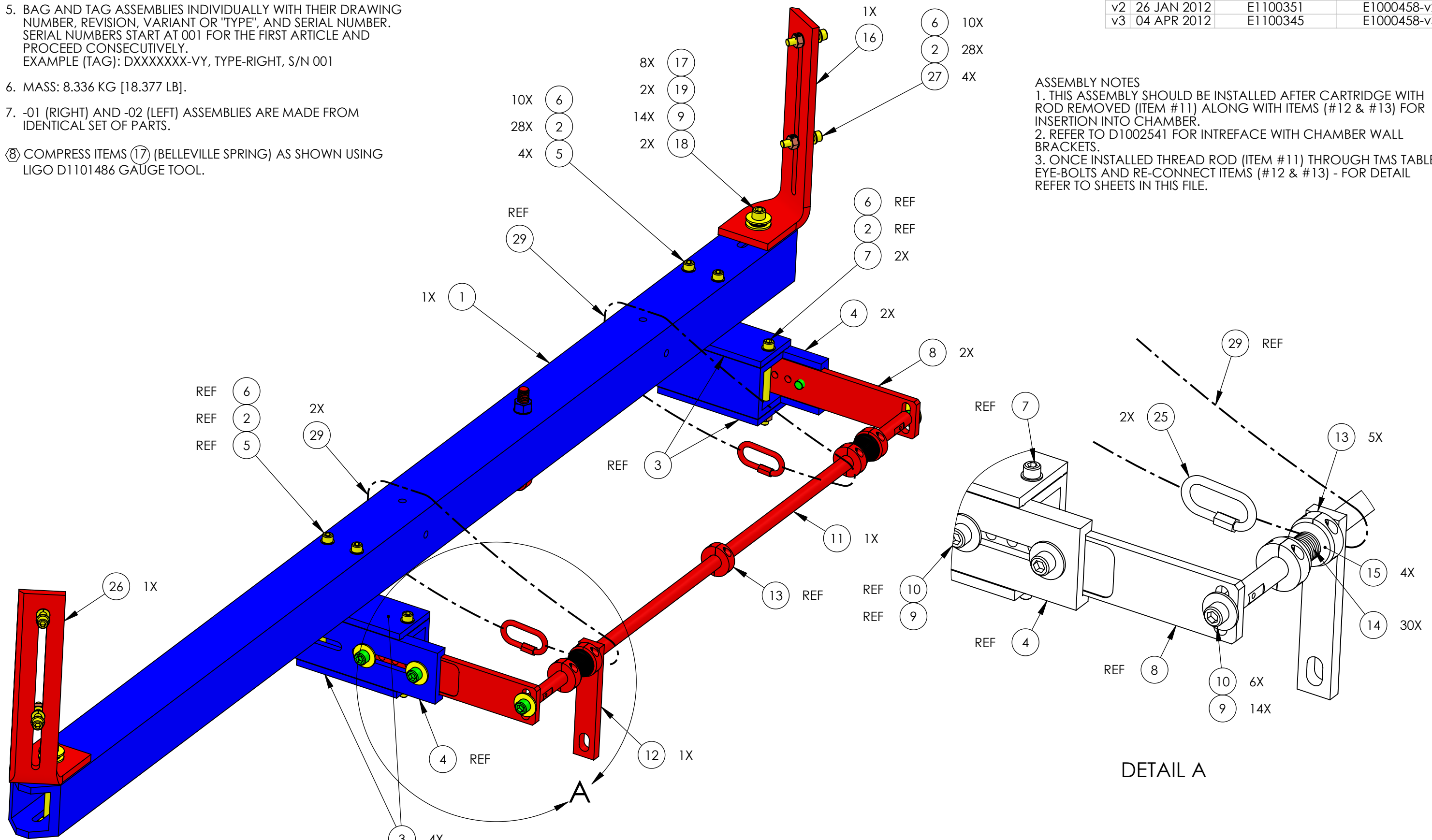
7. -01 (RIGHT) AND -02 (LEFT) ASSEMBLIES ARE MADE FROM IDENTICAL SET OF PARTS.

8. COMPRESS ITEMS (17) (BELLEVILLE SPRING) AS SHOWN USING LIGO D1101486 GAUGE TOOL.

REV.	DATE	DCN #	DRAWING TREE #
v1	26 MAY 2011	E1000384	E1000458-v1
v2	26 JAN 2012	E1100351	E1000458-v2
v3	04 APR 2012	E1100345	E1000458-v3

ASSEMBLY NOTES

1. THIS ASSEMBLY SHOULD BE INSTALLED AFTER CARTRIDGE WITH ROD REMOVED (ITEM #11) ALONG WITH ITEMS (#12 & #13) FOR INSERTION INTO CHAMBER.
2. REFER TO D1002541 FOR INTERFACE WITH CHAMBER WALL BRACKETS.
3. ONCE INSTALLED THREAD ROD (ITEM #11) THROUGH TMS TABLE EYE-BOLTS AND RE-CONNECT ITEMS (#12 & #13) - FOR DETAIL REFER TO SHEETS IN THIS FILE.



D1001781 LIGO TMS SEISMIC SAFETY STOP STRUCTURE, PART PDM REV: X-205, DRAWING PDM REV: X-131

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

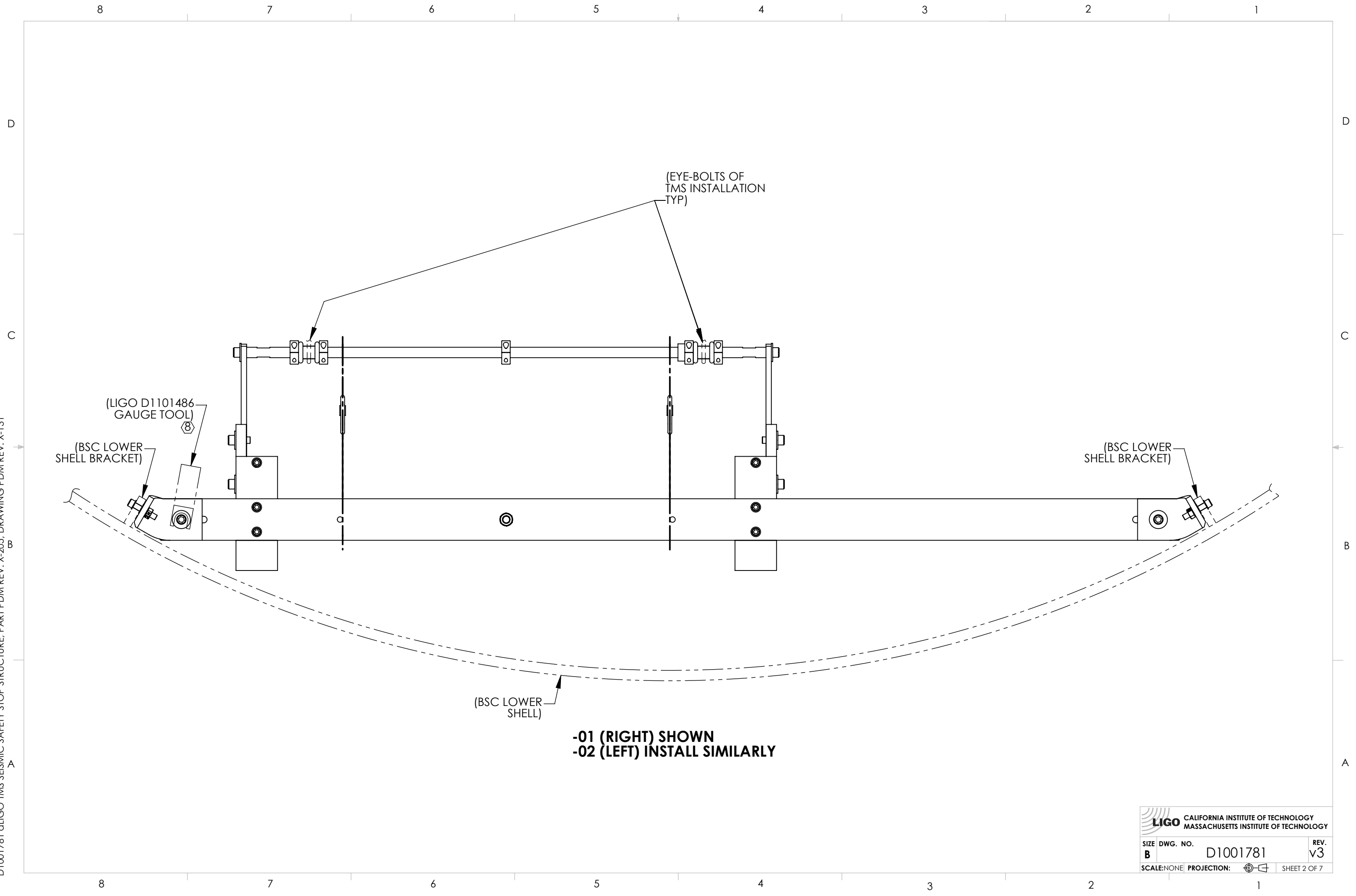
TOLERANCES:
 .XX ± .02
 .XXX ± .010
 ANGULAR ± N/A°


1. INTERPRET DRAWING PER ASME Y14.5-1994.
 2. REMOVE ALL SHARP EDGES, .005-.015, FOR MACHINED PARTS. ROUND ALL EDGES APPROXIMATELY R.02 FOR SHEET METAL PARTS.
 3. DO NOT SCALE FROM DRAWING.
 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL	N/A	FINISH	N/A μinch
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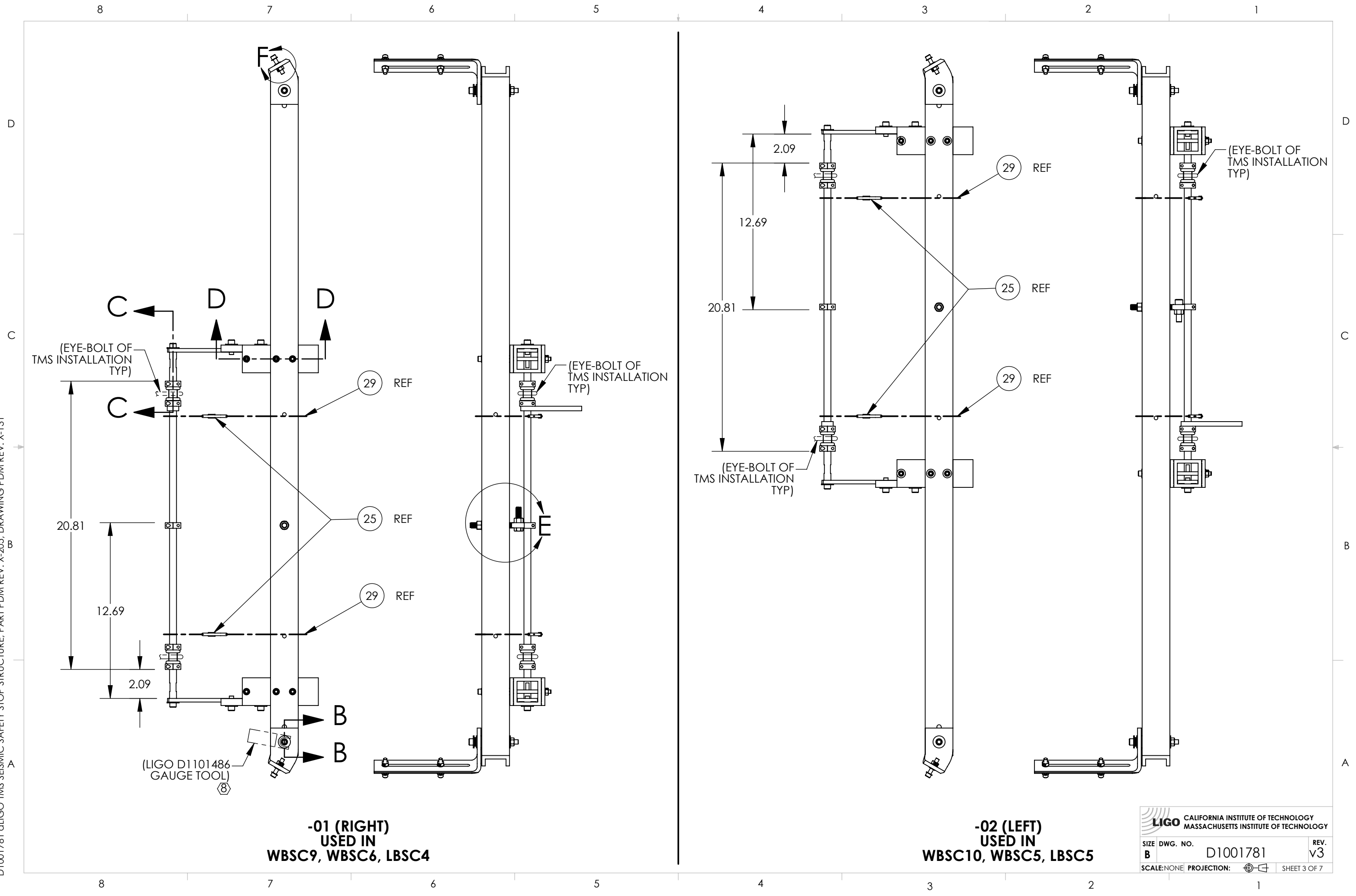
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME ALIGO TMS SEISMIC SAFETY STOP STRUCTURE	
SYSTEM ADVANCED LIGO	SUB-SYSTEM AOS	DESIGNER K. MAILLAND 12 AUG 2010	SIZE DWG. NO. B D1001781
DRAFTER M. MILLER 26 MAY 2011	CHECKER SEE DCN	APPROVAL SEE DCN	REV. v3
NEXT ASSY D0900502 D0900512 D0901150 D0901154 D0900471 D0900506	SCALE: NONE PROJECTION: SHEET 1 OF 7		

D1001781 LIGO TMS SEISMIC SAFETY STOP STRUCTURE, PART PDM REV: X-205, DRAWING PDM REV: X-131



 CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		
SIZE	DWG. NO.	REV.
B	D1001781	v3
SCALE: NONE	PROJECTION:	SHEET 2 OF 7

D1001781 LIGO TMS SEISMIC SAFETY STOP STRUCTURE, PART PDM REV: X-205, DRAWING PDM REV: X-131



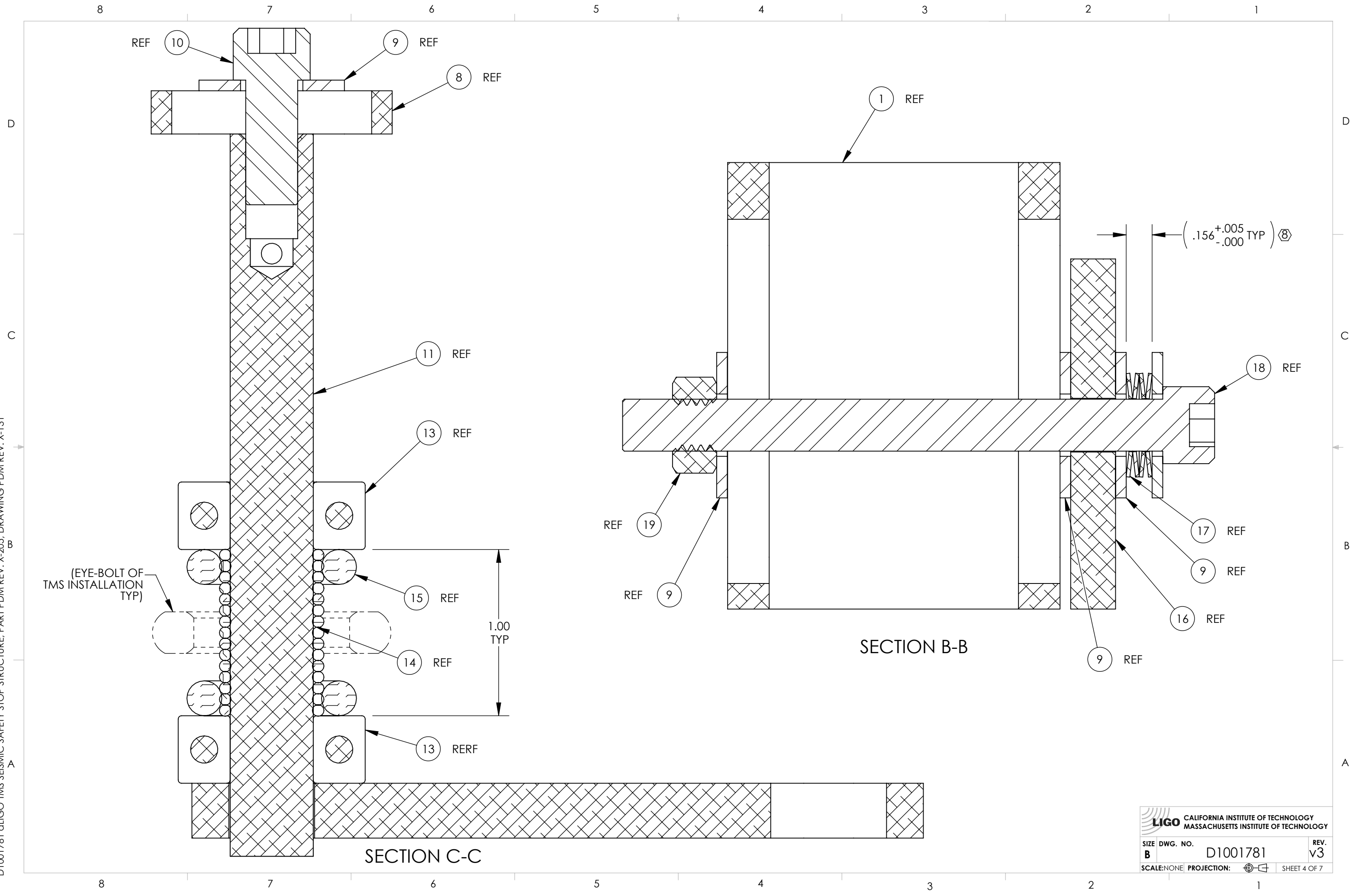
-01 (RIGHT)
USED IN
WBSC9, WBSC6, LBSC4

-02 (LEFT)
USED IN
WBSC10, WBSC5, LBSC5

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE	DWG. NO.	REV.
B	D1001781	v3
SCALE: NONE		PROJECTION:
		SHEET 3 OF 7

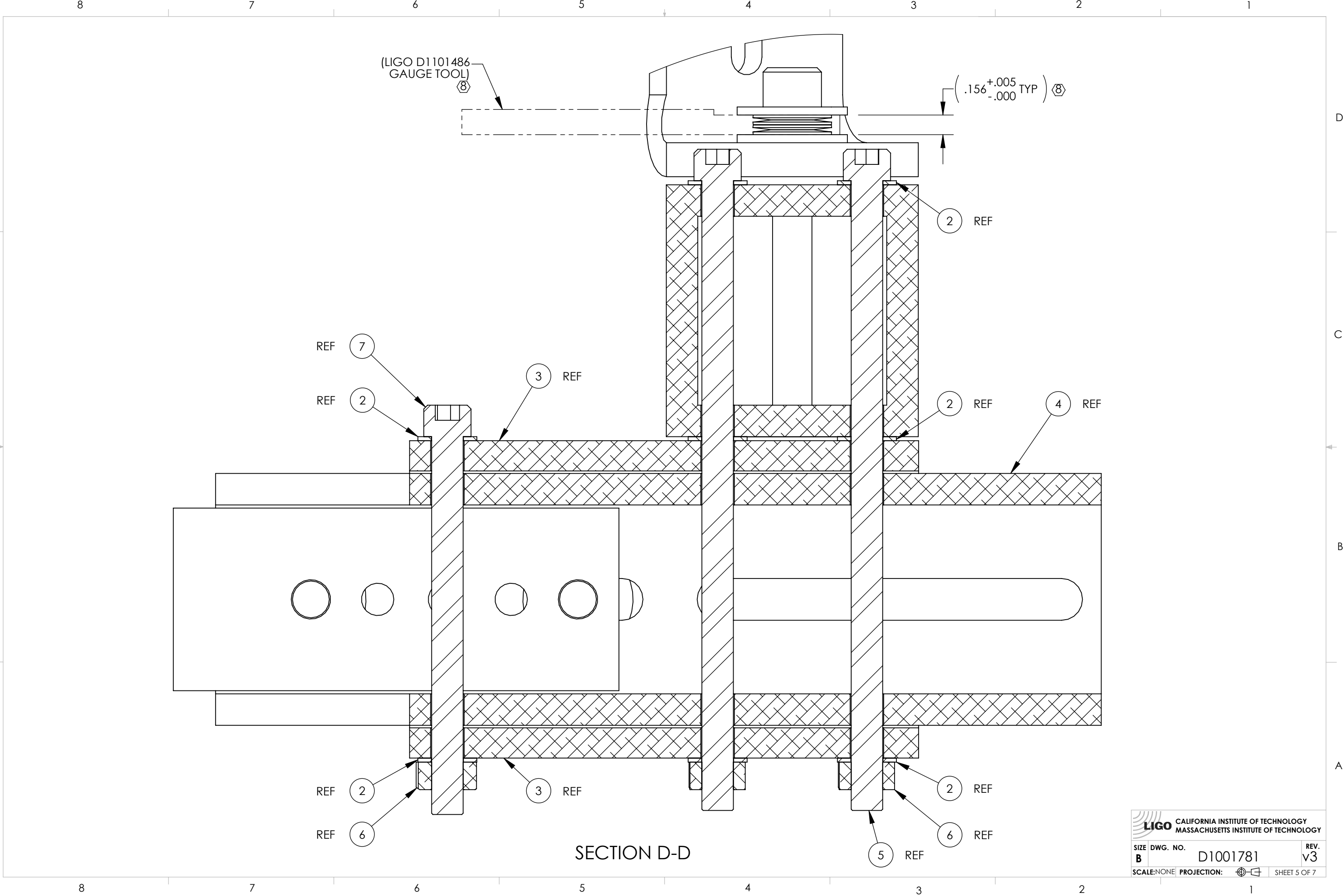
D1001781 dLIGO TMS SEISMIC SAFETY STOP STRUCTURE, PART PDM REV: X-205, DRAWING PDM REV: X-131




LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE	DWG. NO.	REV.
B	D1001781	v3
SCALE: NONE	PROJECTION:	SHEET 4 OF 7

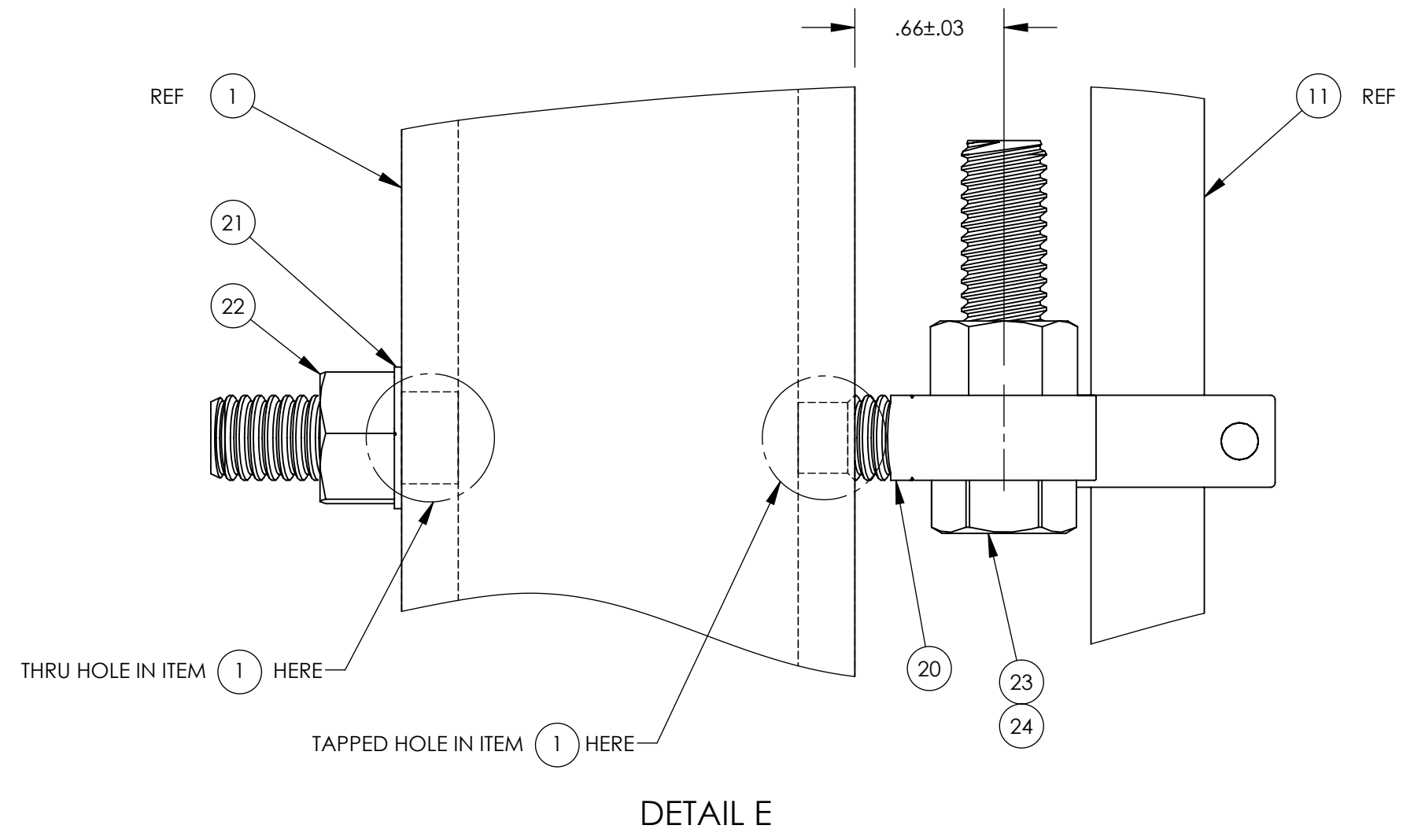
D1001781 dLIGO TMS SEISMIC SAFETY STOP STRUCTURE, PART PDM REV: X-205, DRAWING PDM REV: X-131




SECTION D-D

 CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		
SIZE	DWG. NO.	REV.
B	D1001781	v3
SCALE: NONE	PROJECTION:	SHEET 5 OF 7

D1001781 dLIGO TMS SEISMIC SAFETY STOP STRUCTURE, PART PDM REV: X-205, DRAWING PDM REV: X-131



 CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		
SIZE	DWG. NO.	REV.
B	D1001781	v3
SCALE: NONE	PROJECTION:	SHEET 6 OF 7

D1001781 LIGO TMS SEISMIC SAFETY STOP STRUCTURE, PART PDM REV: X-205, DRAWING PDM REV: X-131

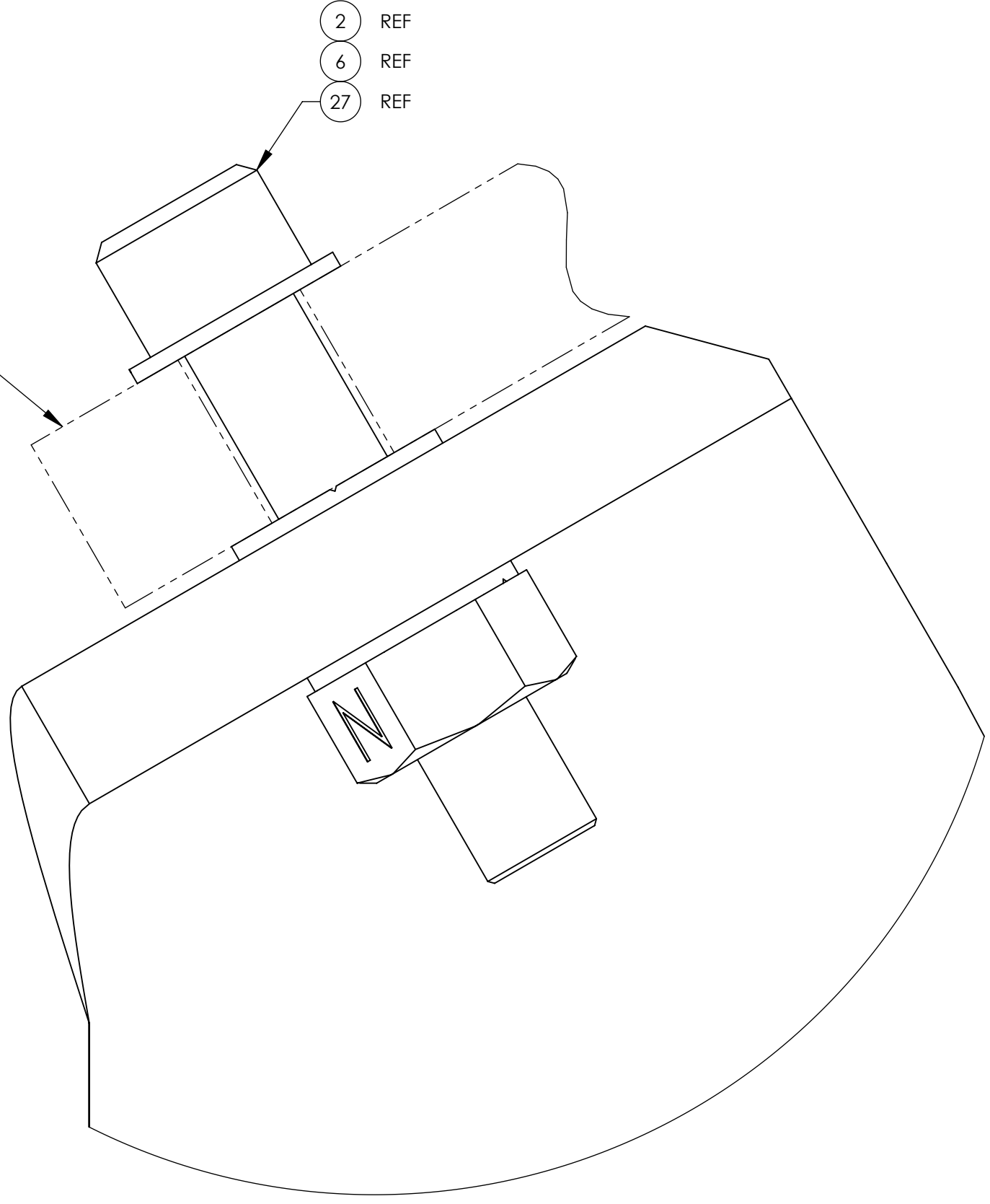
8 7 6 5 4 3 2 1

D
C
B
A



D
C
B
A

- 2 REF
- 6 REF
- 27 REF

(BSC LOWER SHELL BRACKET)



DETAIL F

 CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		
SIZE B	DWG. NO. D1001781	REV. v3
SCALE: NONE	PROJECTION: 	SHEET 7 OF 7

8 7 6 5 4 3 2 1

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX

6. MASS: 0.539 KG [1.188 LB].

7. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.

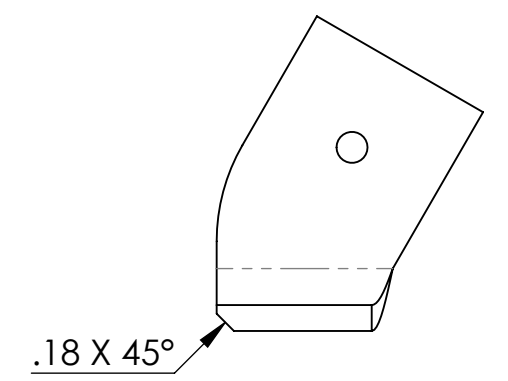
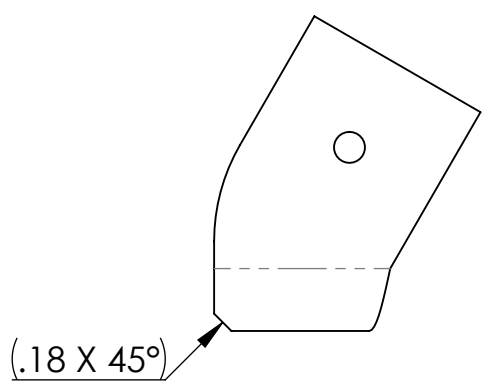
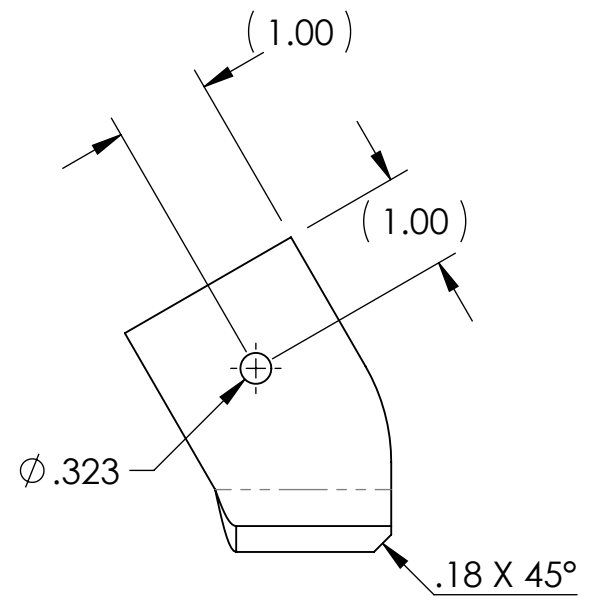
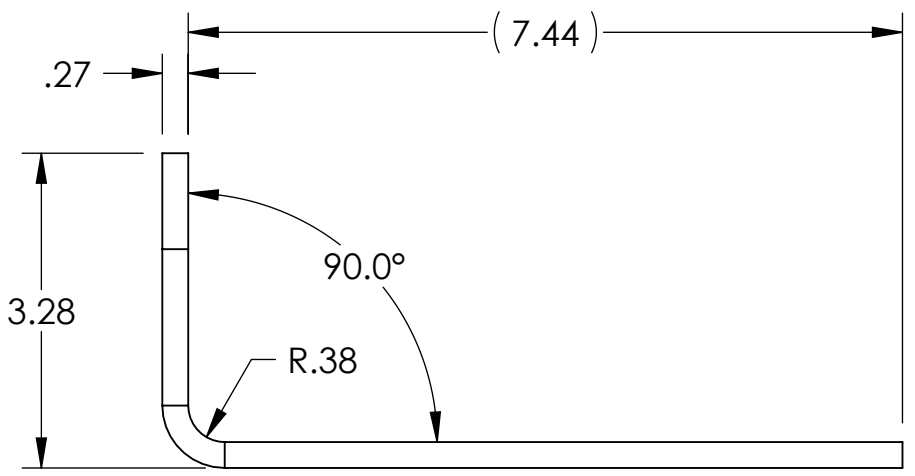
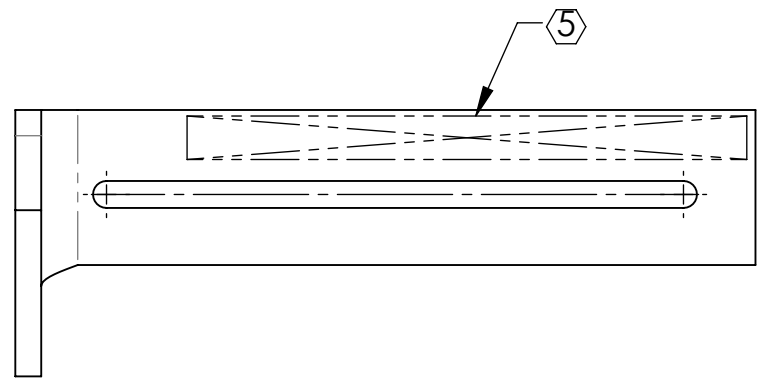
8. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

9. NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. IN GENERAL WELD REPAIRS AND PRESS FIT INSERT REPAIRS ARE NEVER ACCEPTABLE; THE MATERIAL SHOULD BE MADE WITH VIRGIN MATERIAL. SPECIAL CIRCUMSTANCES CAN BE REVIEWED IF / WHEN BROUGHT TO THE ATTENTION OF LIGO CONTRACTING OFFICER'S REPRESENTATIVE (COTR) THROUGH A MATERIAL REVIEW BOARD (MRB) PROCESS, REFER TO LIGO-E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	21 MAR 2011	E1000384	-
v2	07 MAR 2012	E1100351	-
v3	01 APR 2012	E1100345	-

**-02
(LEFT HANDED)**

**-01
(RIGHT HANDED)**

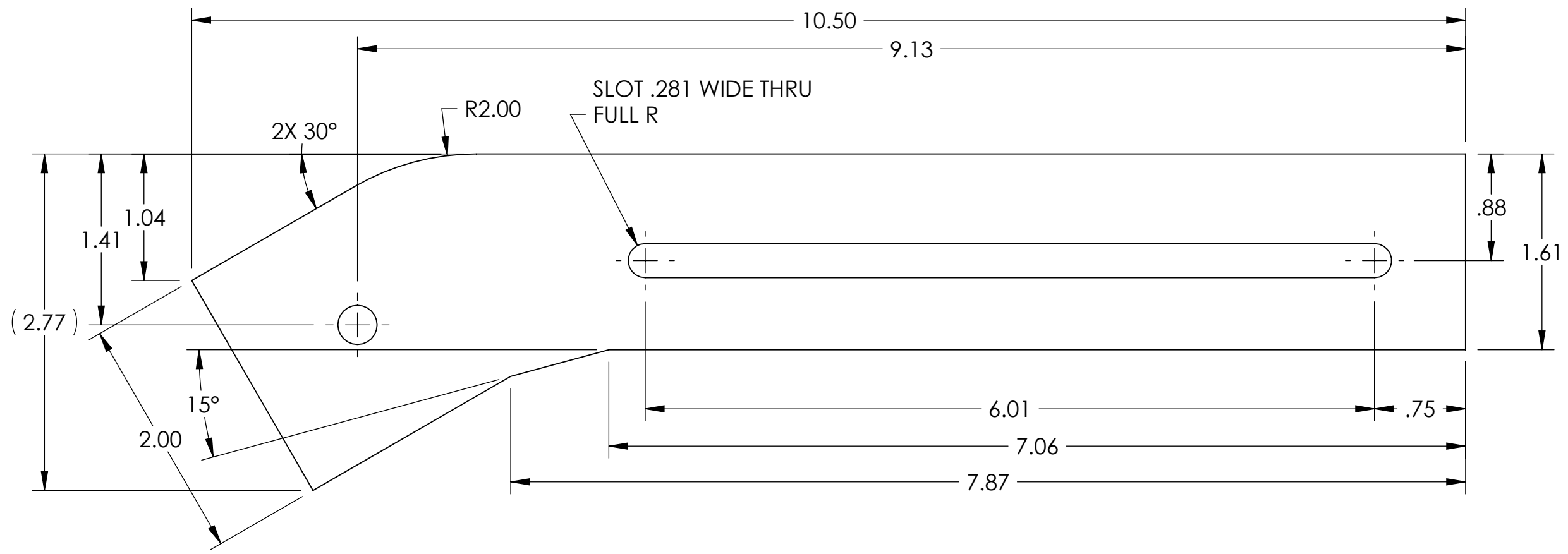


**-01 (RIGHT HANDED) SHOWN DETAILED
 -02 (LEFT HANDED) BEND OPPOSITE**


D1001929 aLIGO TMS SEISMIC SAFETY STOP CHAMBER BRACKET, PART PDM REV: X-042, DRAWING PDM REV: X-028

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 1.0°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		aLIGO TMS SEISMIC SAFETY STOP CHAMBER BRACKET	
MATERIAL		FINISH		NEXT ASSY		DESIGNER	
304 SSSL		63 μinch Ra		D1001781		K. MAILAND	
						29 JUL 2010	
						M. MILLER	
						21 MAR 2011	
						SEE DCN	
						SEE DCN	
				SUB-SYSTEM		SIZE DWG. NO.	
				AOS		B	
						D1001929	
						v3	
						SCALE: NONE	
						PROJECTION:	
						SHEET 1 OF 2	

D1001929 dLIGO TMS SEISMIC SAFETY STOP CHAMBER BRACKET, PART PDM REV: X-042, DRAWING PDM REV: X-028



FLAT-PATTERN

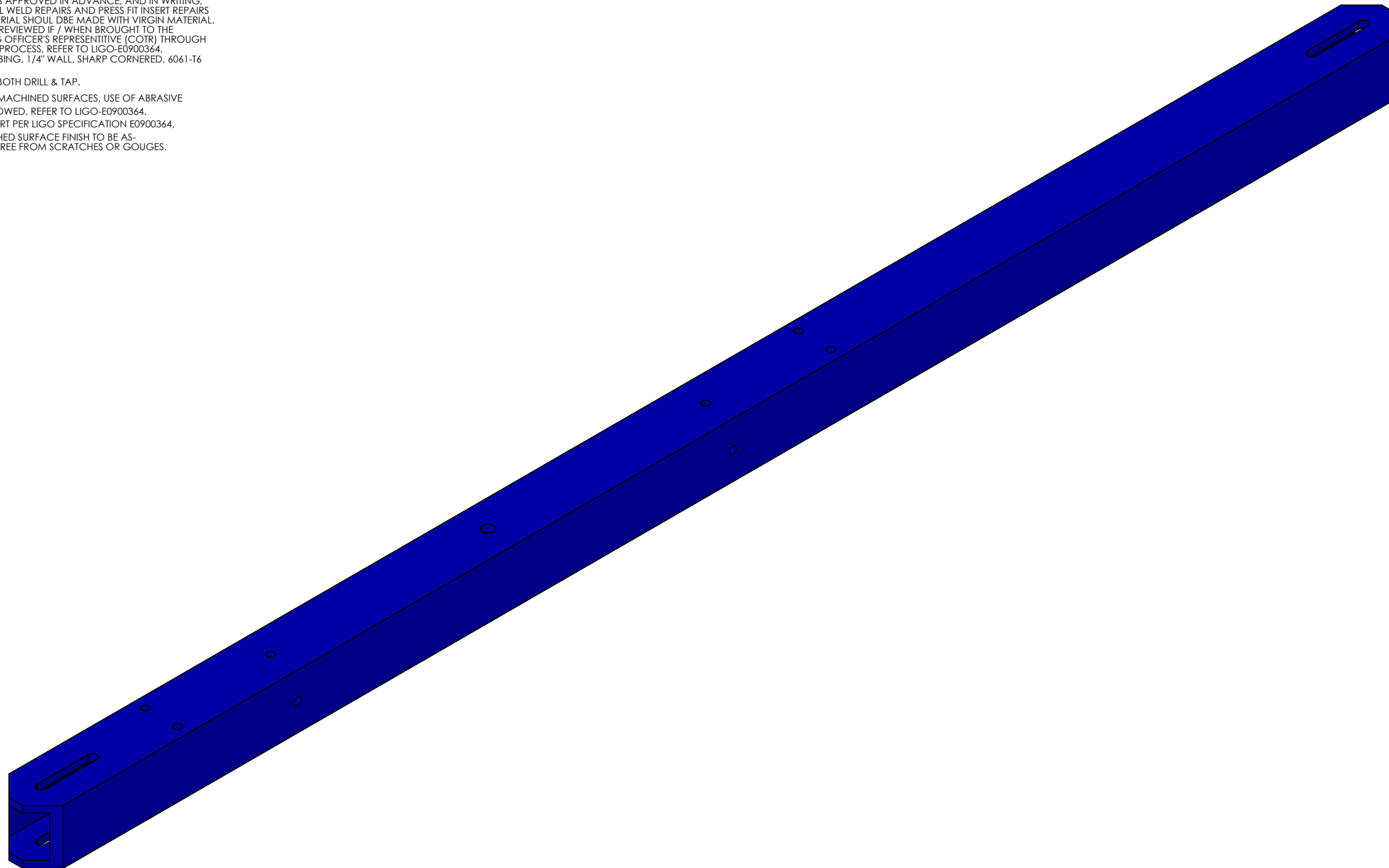
 CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		
SIZE	DWG. NO.	REV.
B	D1001929	v3
SCALE: NONE	PROJECTION:	SHEET 2 OF 2

8 7 6 5 4 3 2 1

NOTES CONTINUED:

- ⑤ SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. APPROXIMATE WEIGHT = 8.38 LB [3.80 KG].
- 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 8. NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. IN GENERAL WELD REPAIRS AND PRESS FIT INSERT REPAIRS ARE NEVER ACCEPTABLE; THE MATERIAL SHOULD BE MADE WITH VIRGIN MATERIAL. SPECIAL CIRCUMSTANCES CAN BE REVIEWED IF / WHEN BROUGHT TO THE ATTENTION OF LIGO CONTRACTING OFFICER'S REPRESENTATIVE (COTR) THROUGH A MATERIAL REVIEW BOARD (MRB) PROCESS, REFER TO LIGO-E0900364.
- ⑦ MATERIAL: 2" SEAMLESS SQUARE TUBING, 1/4" WALL, SHARP CORNERED, 6061-T6 ALUMINIUM ALLOY.
- ⑩ TAPPED HOLES- USE .005 OVERSIZE BOTH DRILL & TAP.
- ⑪ SPECIFIED FINISH APPLIES ONLY TO MACHINED SURFACES, USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED, REFER TO LIGO-E0900364.
- ⑫ ELECTRO-POLISH CUT & DRILLED PART PER LIGO SPECIFICATION E0900364, SECTION 5.1.2. PRE-ELECTRO-POLISHED SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	21 MAR 2011	E1000384-v1	-
-	-	-	-
-	-	-	-



D1001937_CROSS BAR FOR EARTHQUAKE STOP TMS, PART PDM REV: X-053, DRAWING PDM REV: X-021

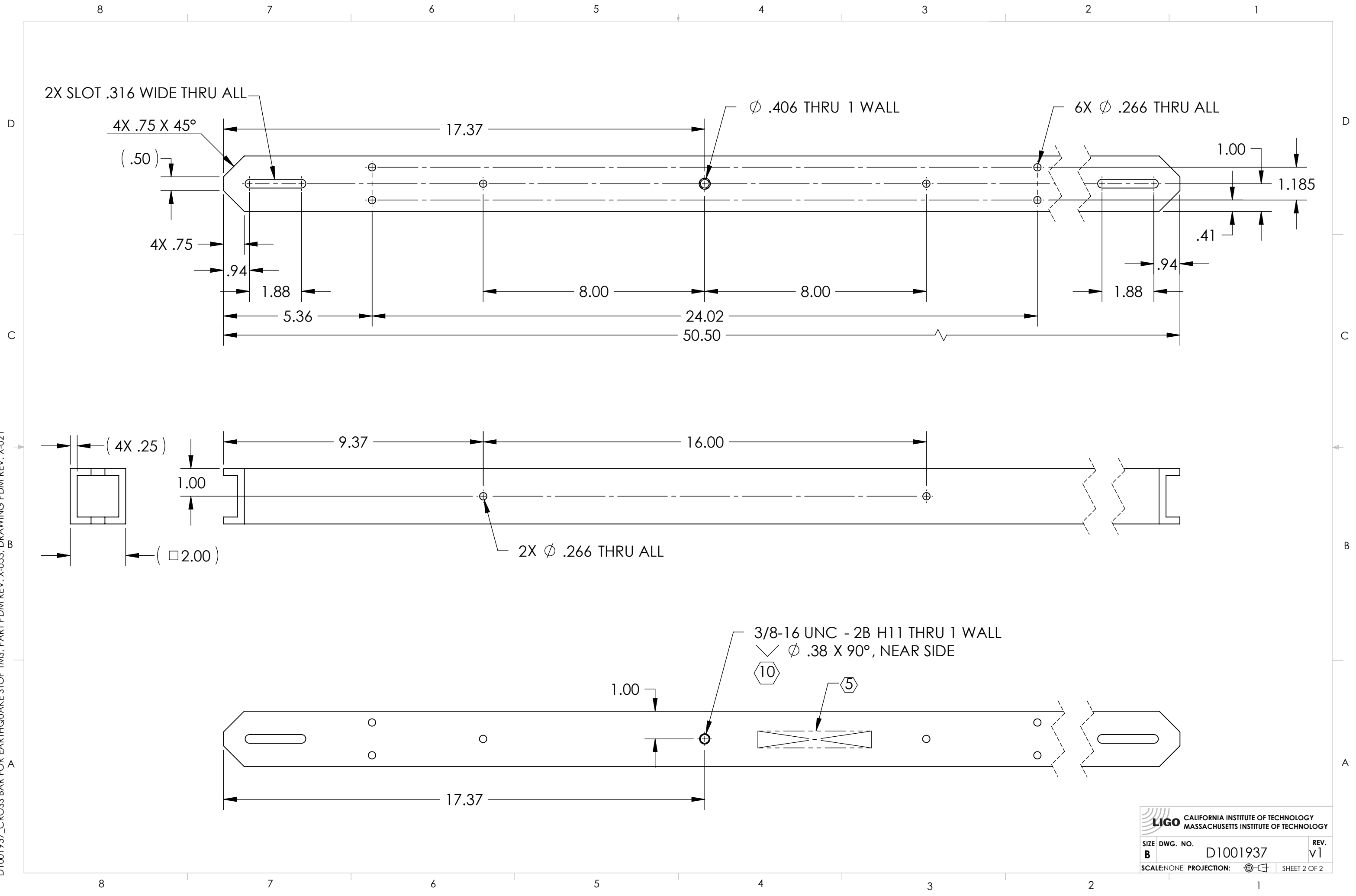
A B C D

A B C D

<p>NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)</p> <p>DIMENSIONS ARE IN INCHES</p> <p>TOLERANCES: .XX ± .01 .XXX ± .005</p> <p>ANGULAR ± 2.0°</p>		<p>1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.</p>		<p>LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY</p>		<p>PART NAME aLIGO TMS EARTHQUAKE STOP CROSS BAR</p>	
<p>MATERIAL ⑦</p>		<p>FINISH 63 μinch Ra ⑪⑫</p>		<p>SYSTEM ADVANCED LIGO</p>		<p>SUB-SYSTEM AOS</p>	
<p>DESIGNER K. MAILAND</p>		<p>DATE 24 JUL 2010</p>		<p>SIZE B</p>		<p>DWG. NO. D1001937</p>	
<p>DRAFTER M. MILLER</p>		<p>DATE 21 MAR 2011</p>		<p>REVISION v1</p>		<p>SCALE: NONE PROJECTION: </p>	
<p>CHECKER</p>		<p>APPROVAL</p>		<p>NEXT ASSY D1001781</p>		<p>SHEET 1 OF 2</p>	

8 7 6 5 4 3 2 1

D1001937_CROSS BAR FOR EARTHQUAKE STOP TMS, PART PDM REV: X-053, DRAWING PDM REV: X-021

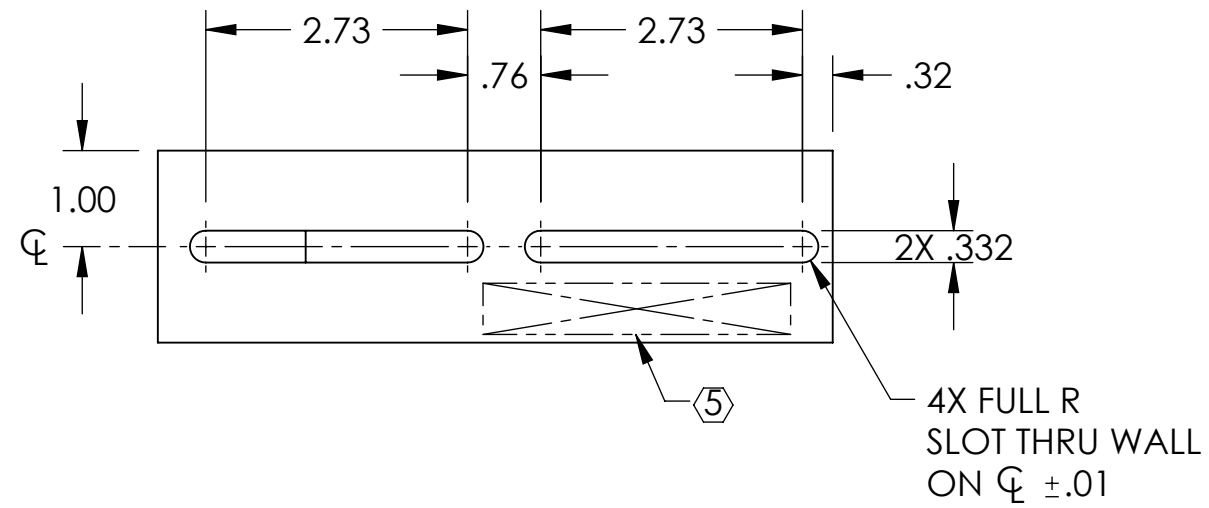
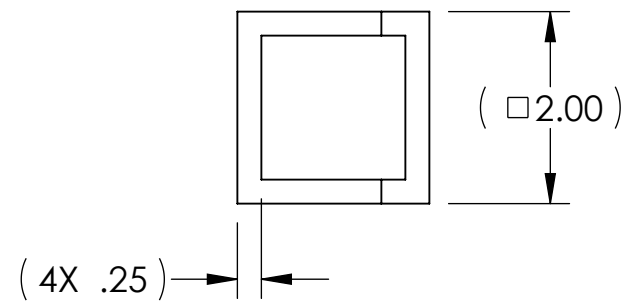
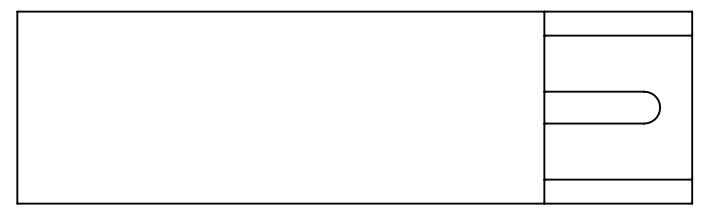
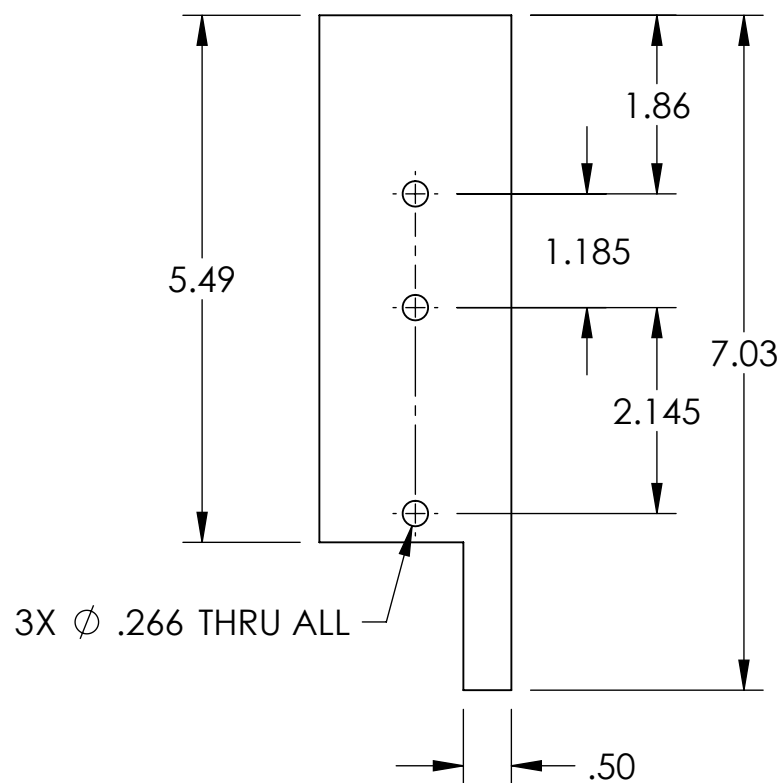
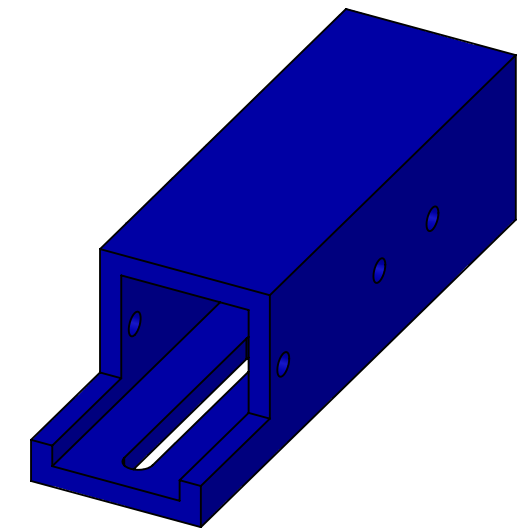


LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE	DWG. NO.	REV.
B	D1001937	v1
SCALE: NONE	PROJECTION:	SHEET 2 OF 2

- NOTES CONTINUED:**
- ⑤ SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 - 6. APPROXIMATE WEIGHT = .97 LB [.44 KG].
 - 7. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - 8. NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. IN GENERAL WELD REPAIRS AND PRESS FIT INSERT REPAIRS ARE NEVER ACCEPTABLE; THE MATERIAL SHOULD BE MADE WITH VIRGIN MATERIAL. SPECIAL CIRCUMSTANCES CAN BE REVIEWED IF / WHEN BROUGHT TO THE ATTENTION OF LIGO CONTRACTING OFFICER'S REPRESENTATIVE (COTR) THROUGH A MATERIAL REVIEW BOARD (MRB) PROCESS. REFER TO LIGO-E0900364.
 - ⑨ MATERIAL: 2" SEAMLESS SQUARE TUBING, 1/4" WALL, SHARP CORNERED, 6061-T6 ALUMINUM ALLOY.
 - ⑩ SPECIFIED FINISH APPLIES ONLY TO MACHINED SURFACES, USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED. REFER TO LIGO-E0900364.
 - ⑪ ELECTRO-POLISH CUT & DRILLED PART PER LIGO SPECIFICATION E0900364, SECTION 5.1.2. PRE-ELECTRO-POLISHED SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.

REV.	DATE	DCN #	DRAWING TREE #
v1	21 MAR 2011	E1000384-v1	-
-	-	-	-
-	-	-	-



D1001939_TIE IN TO EARTHQUAKE STOP SIDE BAR RT, PART PDM REV: X-032, DRAWING PDM REV: X-013

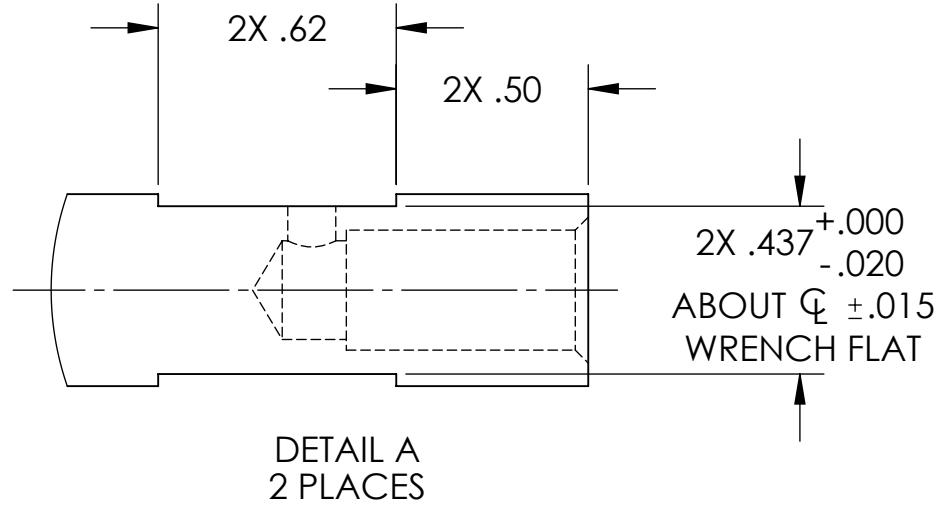
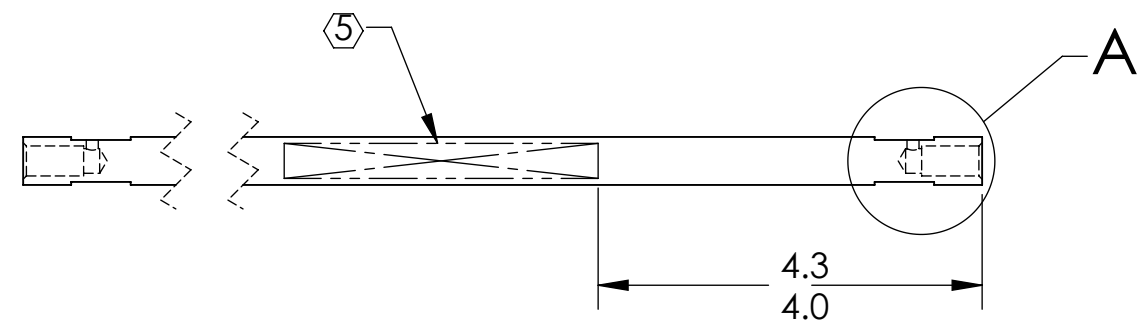
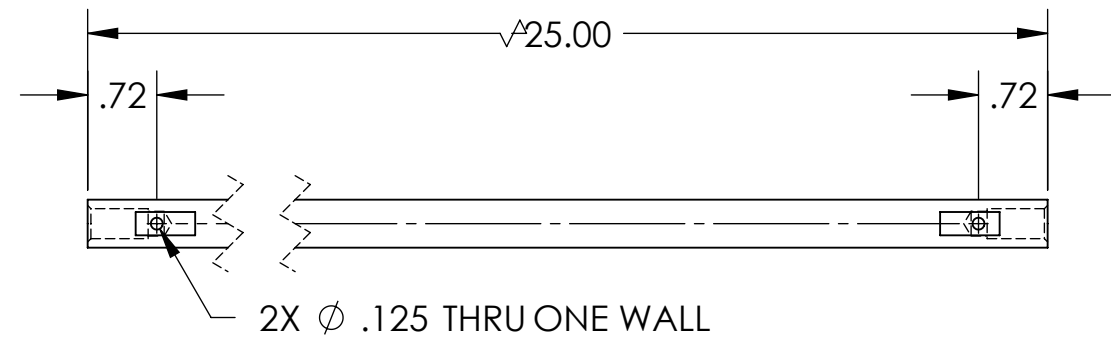
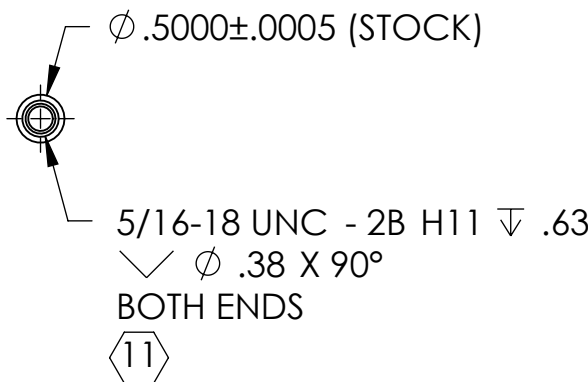
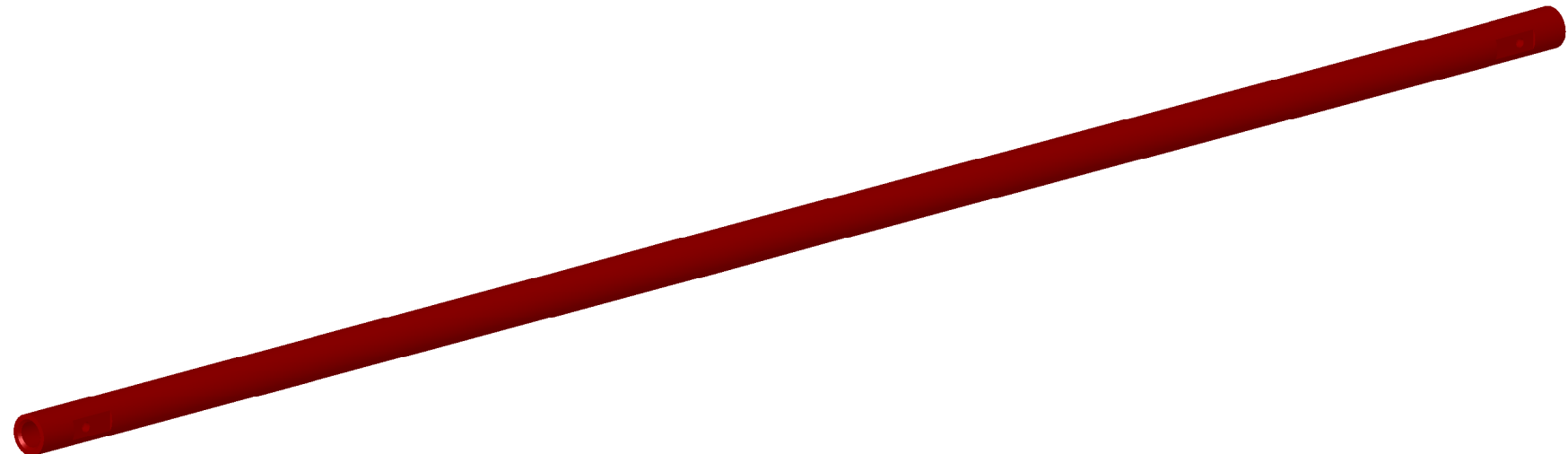
NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)	
DIMENSIONS ARE IN INCHES	
TOLERANCES: .XX ± .01 .XXX ± .005	
ANGULAR ± 1.0°	
1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.	
MATERIAL	FINISH
⑨	63 μ inch Ra ⑩⑪

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
ADVANCED LIGO		aLIGO TMS STOP SIDE BAR	
DESIGNER	K. MAILAND	24 JUL 2010	SIZE DWG. NO.
DRAFTER	M. MILLER	21 MAR 2011	B D1001939
CHECKER			REV. v1
APPROVAL			SCALE: NONE PROJECTION:
NEXT ASSY D1001781		SHEET 1 OF 1	

8 7 6 5 4 3 2 1

- NOTES CONTINUED:**
- 5. SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 - 6. APPROXIMATE WEIGHT = 1.38 LB [.63 KG]
 - 7. MACHINE ENDS AND ALL ADDED FEATURES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 - 8. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 - 9. NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. IN GENERAL WELD REPAIRS AND PRESS FIT INSERT REPAIRS ARE NEVER ACCEPTABLE; THE MATERIAL SHOULD BE MADE WITH VIRGIN MATERIAL. SPECIAL CIRCUMSTANCES CAN BE REVIEWED IF / WHEN BROUGHT TO THE ATTENTION OF LIGO CONTRACTING OFFICER'S REPRESENTATIVE (COIR) THROUGH A MATERIAL REVIEW BOARD (MRB) PROCESS, REFER TO LIGO-E0900364.
 - 10. MATERIAL: MAKE FROM MCMMASTER-CARR P/N 8934K16 (OR EQUIV)
Ø .5000" X 6' GROUND ROD, TYPE 304 STAINLESS STEEL
 - 11. TAPPED HOLES- USE .005 OVERSIZE BOTH DRILL & TAP.
 - 12. 63 µINCH Ra FINISH APPLIES ONLY TO MACHINED FACES, EXCLUDING THREADS & DRILL HOLES.
 - 13. ELECTRO-POLISH MACHINED PART PER LIGO SPECIFICATION E0900364, SECTION 5.2.2.

REV.	DATE	DCN #	DRAWING TREE #
v1	21 MAR 2011	E1000384-v1	-
-	-	-	-
-	-	-	-



D1001941_qlIGO EARTHQUAKE STOP ROD, PART PDM REV: X-026, DRAWING PDM REV: X-024

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)	
DIMENSIONS ARE IN INCHES	
TOLERANCES: .XX ± .01 .XXX ± .005	
ANGULAR ± °	
MATERIAL	FINISH
10	63 µinch Ra 12 13

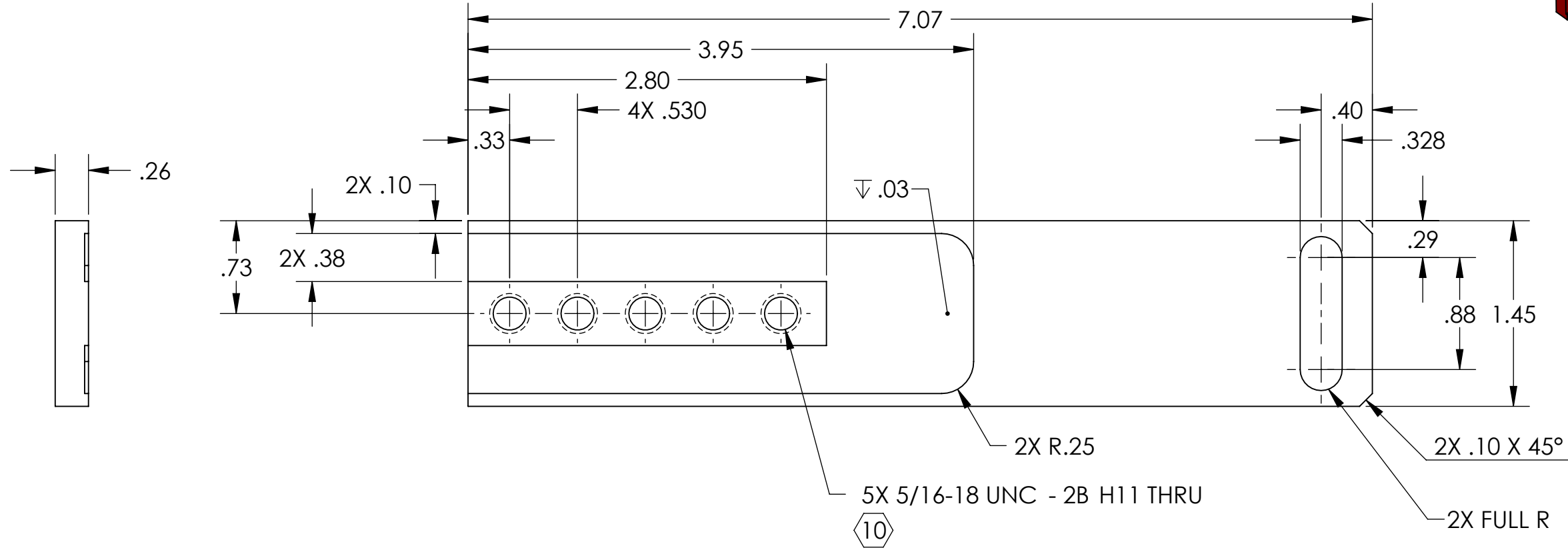
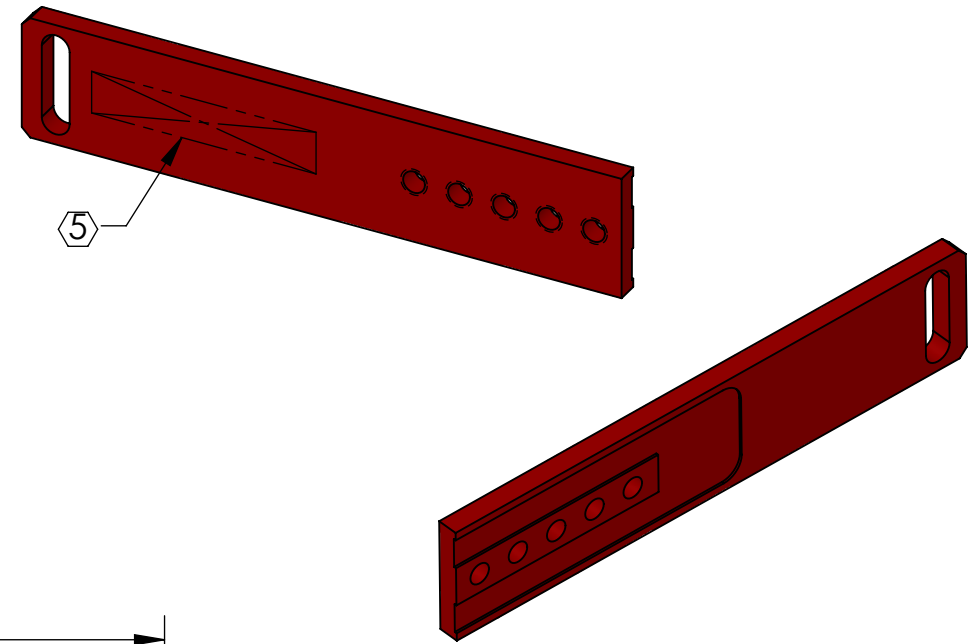
CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
ADVANCED LIGO		αLIGO TMS STOP ROD	
DESIGNER	K. MAILAND	24 JUL 2010	SIZE DWG. NO.
DRAFTER	M. MILLER	21 MAR 2011	B
CHECKER			D1001941
APPROVAL			REV. v1
NEXT ASSY		SCALE: NONE PROJECTION:	
D1001781		SHEET 1 OF 1	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

NOTES CONTINUED:
 5. SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
 6. APPROXIMATE WEIGHT = .648 LB (.294 KG)
 7. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
 8. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
 9. NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. IN GENERAL WELD REPAIRS AND PRESS FIT INSERT REPAIRS ARE NEVER ACCEPTABLE; THE MATERIAL SHOULD BE MADE WITH VIRGIN MATERIAL. SPECIAL CIRCUMSTANCES CAN BE REVIEWED IF / WHEN BROUGHT TO THE ATTENTION OF LIGO CONTRACTING OFFICER'S REPRESENTATIVE (COTR) THROUGH A MATERIAL REVIEW BOARD (MRB) PROCESS. REFER TO LIGO-E0900364.
 10. TAPPED HOLES- USE .005 OVERSIZE BOTH DRILL & TAP.

REV.	DATE	DCN #	DRAWING TREE #
v1	21 MAR 2011	E1000384-v1	-
-	-	-	-
-	-	-	-



D1001942_qlIGO END BRACKET FOR EARTHQUAKE ROD, PART PDM REV: X-036, DRAWING PDM REV: X-017

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES				ADVANCED LIGO		qlIGO TMS END BRACKET ROD	
TOLERANCES: .XX ± .01 .XXX ± .005				SUB-SYSTEM AOS		DESIGNER K. MAILAND	25 JUL 2010
ANGULAR ± 1.0°				NEXT ASSY D1001781		DRAFTER M. MILLER	21 MAR 2011
MATERIAL 304 SSSL				FINISH 63 μinch Ra		CHECKER	
						APPROVAL	
						SCALE: NONE	PROJECTION:
						SIZE DWG. NO. B	D1001942
						REV. v1	
						SHEET 1 OF 1	

8 7 6 5 4 3 2 1

D1001943_dLIGO TOP LONG TUBE EARTHQUAKE STOP PLATE, PART PDM REV: X-022, DRAWING PDM REV: X-018

NOTES CONTINUED:

5. SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX

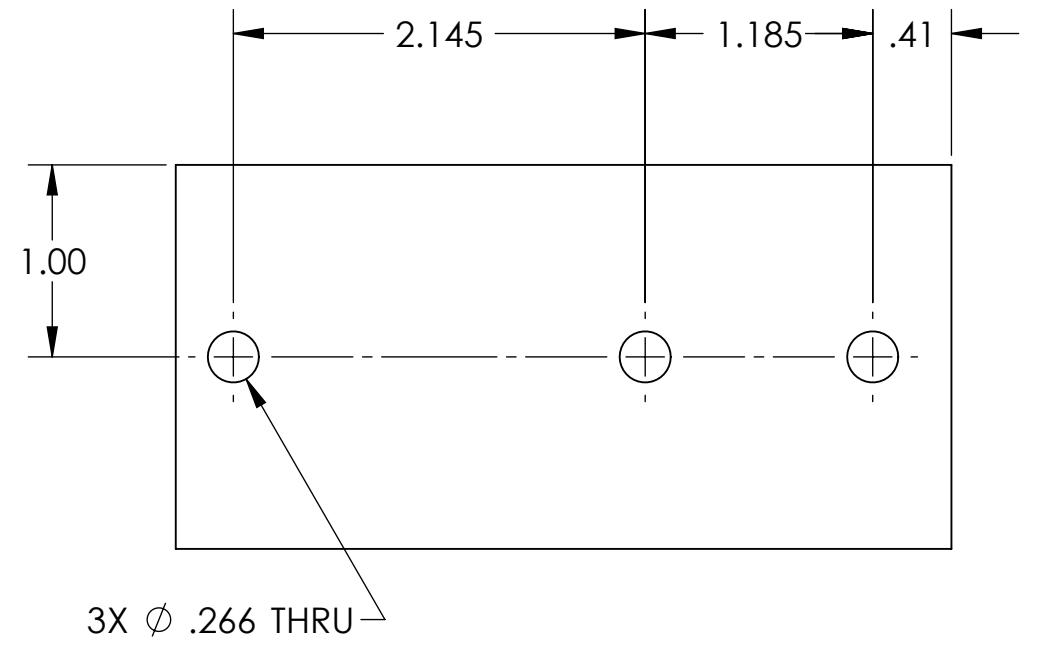
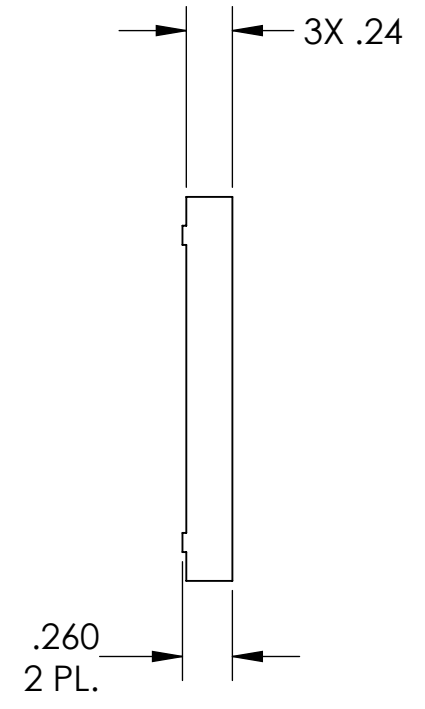
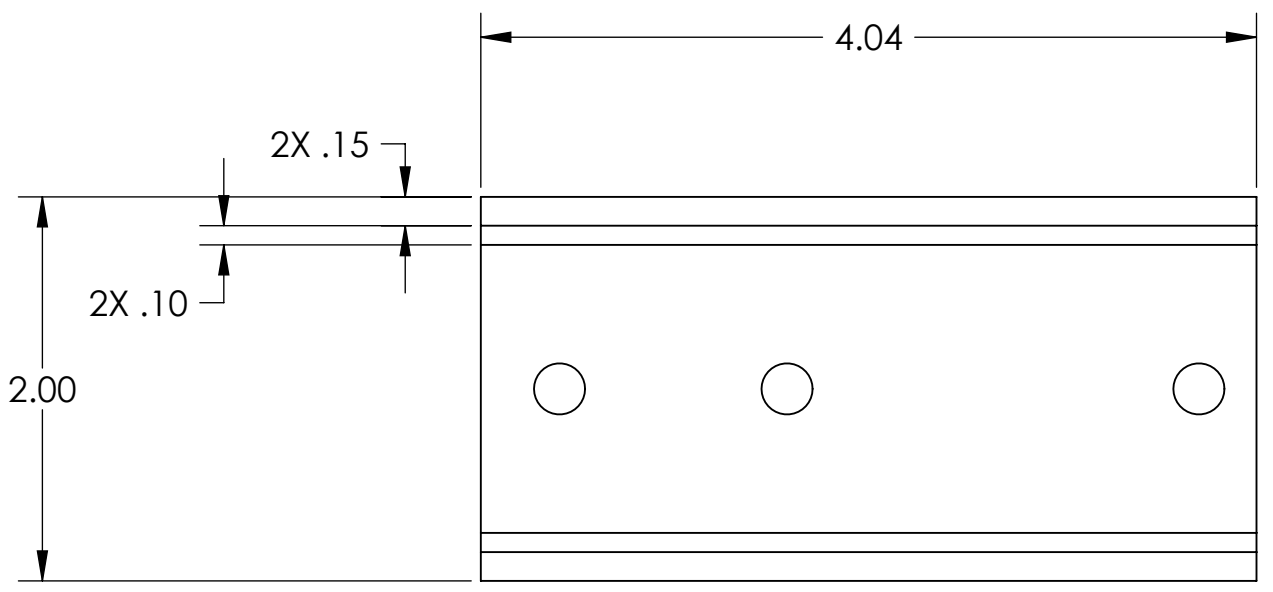
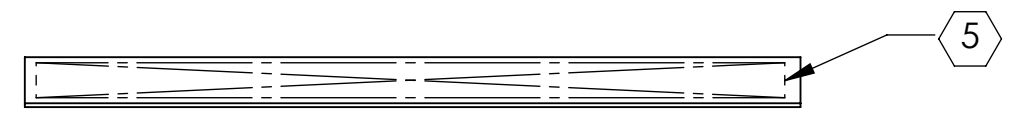
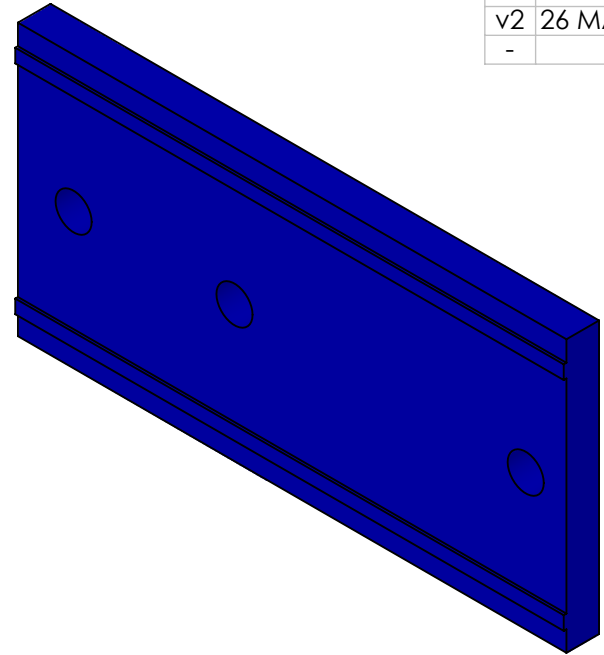
6. APPROXIMATE WEIGHT = .19 LB (84 G)

7. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.

8. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

9. NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. IN GENERAL WELD REPAIRS AND PRESS FIT INSERT REPAIRS ARE NEVER ACCEPTABLE; THE MATERIAL SHOULD BE MADE WITH VIRGIN MATERIAL. SPECIAL CIRCUMSTANCES CAN BE REVIEWED IF / WHEN BROUGHT TO THE ATTENTION OF LIGO CONTRACTING OFFICER'S REPRESENTATIVE (COTR) THROUGH A MATERIAL REVIEW BOARD (MRB) PROCESS, REFER TO LIGO-E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v1	21 MAR 2011	E1000384-v1	-
v2	26 MAR 2012	E1200317-x0	-
-	-	-	-



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)		
DIMENSIONS ARE IN INCHES		
TOLERANCES: .XX ± .01 .XXX ± .005		
ANGULAR ± 1.0°		
1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, .005 -.015. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		
MATERIAL	6061-T6 Al	FINISH 63 μinch Ra

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
SYSTEM ADVANCED LIGO		SUB-SYSTEM AOS	
DESIGNER	K. MAILAND	24 JUL 2010	SIZE DWG. NO.
DRAFTER	M. MILLER	21 MAR 2011	B
CHECKER	SEE DCC	SEE DCC	D1001943
APPROVAL	SEE DCC	SEE DCC	REV. v2
SCALE: NONE		PROJECTION:	
SHEET 1 OF 1			

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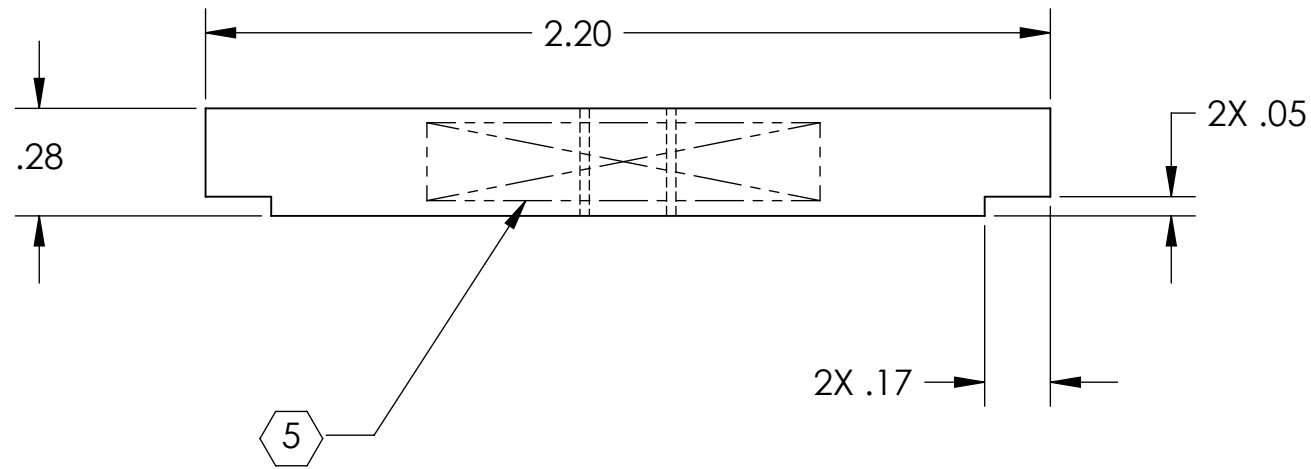
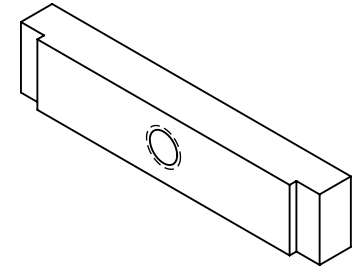
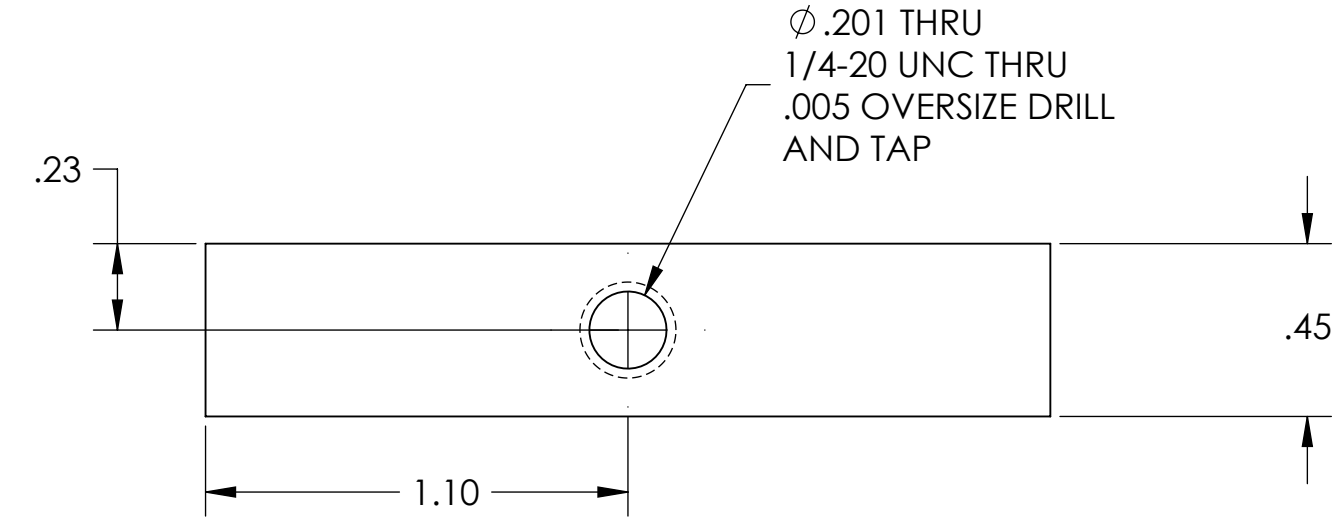
2

1

NOTES CONTINUED:

- 5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX
- 6. APPROXIMATE WEIGHT = X.025 LB.
- 7. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.
- 8. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.
- 9. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NOT WELD REPAIRS OR PLUGS UNLESS APPROVED IN ADVANCE IN WRITING BY LIGO, REFER TO LIGO-E0900364.
- 10. NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. IN GENERAL WELD REPAIRS AND PRESS FIT INSERT REPAIRS ARE NEVER ACCEPTABLE; THE MATERIAL SHOULD BE MADE WITH VIRGIN MATERIAL. SPECIAL CIRCUMSTANCES CAN BE REVIEWED IF / WHEN BROUGHT TO THE ATTENTION OF LIGO CONTRACTING OFFICER'S REPRESENTATIVE (COTR) THROUGH A MATERIAL REVIEW BOARD (MRB) PROCESS, REFER TO LIGO-E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v-1	4/25/2011	E1100351	-
-	-	-	-
-	-	-	-



D1100791 TMS SUS Cable Clamp Plate, Inner, PART PDM REV: X-001, DRAWING PDM REV: X-004

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES		1. INTERPRET DRAWING PER ASME Y14.5-1994.	
TOLERANCES:		2. REMOVE ALL SHARP EDGES, R.02 MIN.	
.XX ± .01		3. DO NOT SCALE FROM DRAWING.	
.XXX ± .005		4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.	
ANGULAR ± 1.0°		MATERIAL	FINISH
		6061-T6 Al	63 μinch

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: **ADVANCED LIGO** SUB-SYSTEM: **AOS**

NEXT ASSY: **D1000549**

PART NAME				TMS SUS CABLE CLAMP PLATE, INNER			
DESIGNER	K. MAILAND	22 APR 2011	SIZE	DWG. NO.		REV.	
DRAFTER	M. MILLER	5/09/2011	B	D1100791		v1	
CHECKER			SCALE: 2:1	PROJECTION:	SHEET 1 OF 1		
APPROVAL							

8

7

6

5

4

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2

1

8 7 6 5 4 3 2 1

NOTES CONTINUED:

5. SCRIBE, ENGRAVE, OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. A VIBRATORY TOOL MAY BE USED.
EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX

6. APPROXIMATE WEIGHT = X.024 LB.

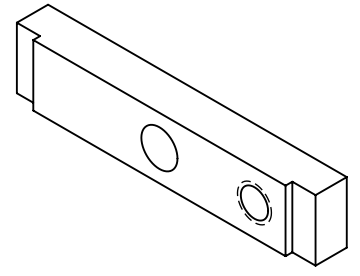
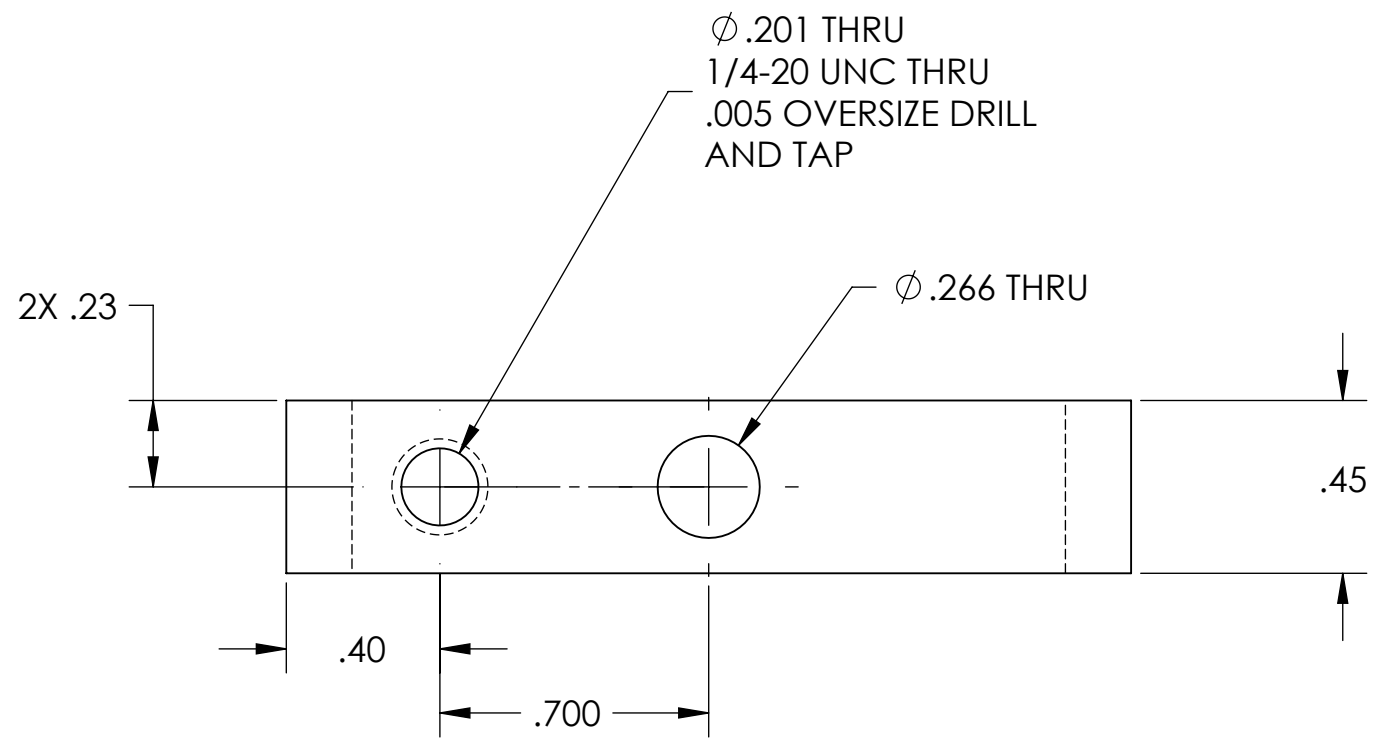
7. MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. USE OF ABRASIVE REMOVAL TECHNIQUES IS NOT ALLOWED.

8. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH LIGO SPECIFICATION E0900364.

9. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NOT WELD REPAIRS OR PLUGS UNLESS APPROVED IN ADVANCE IN WRITING BY LIGO. REFER TO LIGO-E0900364.

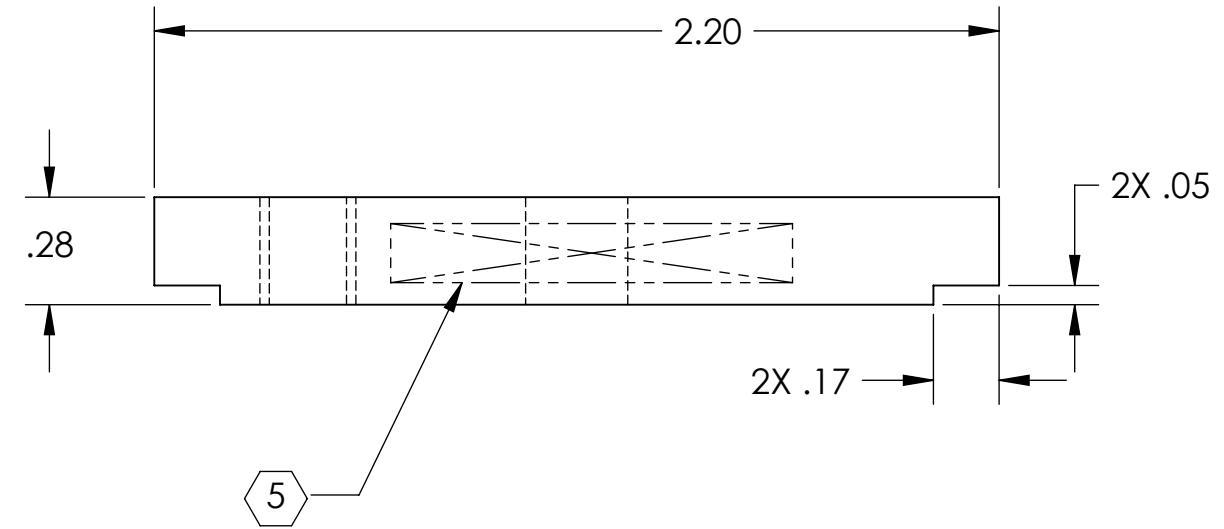
10. NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. IN GENERAL WELD REPAIRS AND PRESS FIT INSERT REPAIRS ARE NEVER ACCEPTABLE; THE MATERIAL SHOULD BE MADE WITH VIRGIN MATERIAL. SPECIAL CIRCUMSTANCES CAN BE REVIEWED IF / WHEN BROUGHT TO THE ATTENTION OF LIGO CONTRACTING OFFICER'S REPRESENTATIVE (COTR) THROUGH A MATERIAL REVIEW BOARD (MRB) PROCESS, REFER TO LIGO-E0900364.

REV.	DATE	DCN #	DRAWING TREE #
v-1	4/25/2011	E1100351	-
-	-	-	-
-	-	-	-



D
C
B
A

D
C
B
A



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME	
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 1.0°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		TMS SUS CABLE CLAMP PLATE, OUTER	
MATERIAL 6061-T6 Al		FINISH 63 μinch		SYSTEM ADVANCED LIGO		SUB-SYSTEM AOS	
NEXT ASSY D1000549				DESIGNER K. MAILAND 22 APR 2011		SIZE DWG. NO. B D1100792	
APPROVAL				DRAFTER M. MILLER 5/09/2011		REV. v1	
SCALE: 2:1				PROJECTION:		SHEET 1 OF 1	

8 7 6 5 4 3 2 1

D1100792 TMS SUS Cable Clamp Plate, Outer, PART PDM REV: X-002, DRAWING PDM REV: X-005

8 7 6 5 4 3 2 1

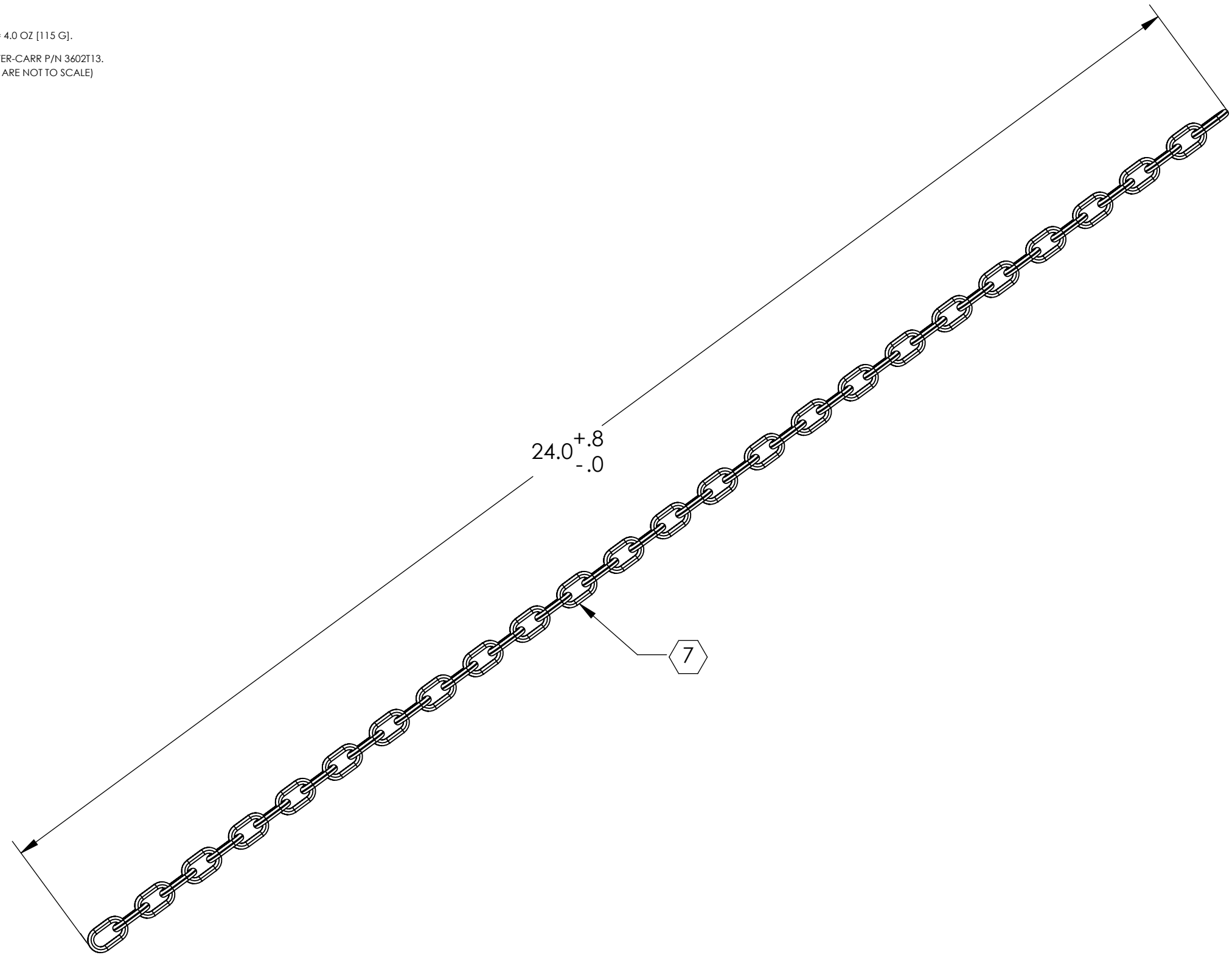
NOTES CONTINUED:

5. BAG AND TAG PARTS SEPARATELY WITH THEIR DRAWING PART NUMBER, REVISION, AND SERIAL NUMBER. SERIAL NUMBERS START AT 001 (UNLESS OTHERWISE SPECIFIED) FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY.
 EXAMPLE:
 DXXXXXX-vY
 S/N-001

6. APPROXIMATE WEIGHT = 4.0 OZ [115 G].

7. MAKE FROM McMASTER-CARR P/N 3602T13.
 (CHAIN LINKS SHOWN ARE NOT TO SCALE)

REV.	DATE	DCN #	DRAWING TREE #
v1	05/25/2011	E1100351-v1	-
-	-	-	-
-	-	-	-



D1100988.qLIGO TMS SEISMIC SAFETY STOP CHAIN, PART PDM REV: X-000, DRAWING PDM REV: X-002

D
C
B
A

D
C
B
A

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				LIGO		CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		PART NAME						
DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .01 .XXX ± .005 ANGULAR ± 1.0°				1. INTERPRET DRAWING PER ASME Y14.5-1994. 2. REMOVE ALL SHARP EDGES, R.02 MIN. 3. DO NOT SCALE FROM DRAWING. 4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.		ADVANCED LIGO		SUB-SYSTEM AOS		DESIGNER M. MILLER 25 MAY 2011 DRAFTER M. MILLER 5/25/2011 CHECKER APPROVAL		SIZE DWG. NO. B D1100988		REV. v1
MATERIAL N/A				FINISH N/A μinch		NEXT ASSY D10001781		SCALE: 1:2		PROJECTION:		SHEET 1 OF 1		

8 7 6 5 4 3 2 1